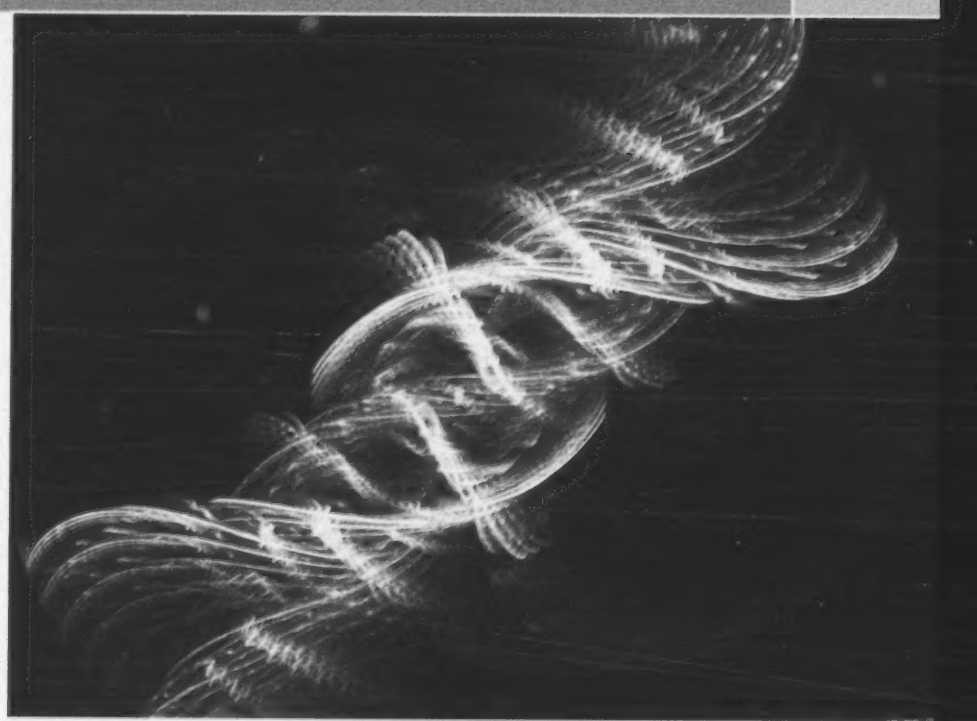
2012-2013

NATIONAL DNA DATA BANK ADVISORY COMMITTEE ANNUAL REPORT



NDDB AC

2012-2013

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Introduction

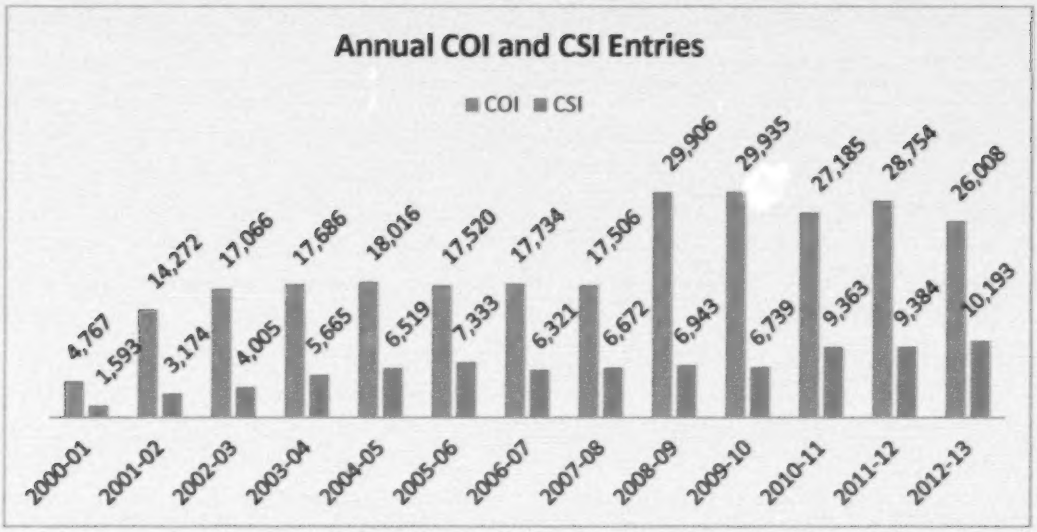
The National DNA Data Bank (NDDB) was established pursuant to the *DNA Identification Act*, 1998, c.37 and commenced operations in June 2000 under the stewardship of the Royal Canadian Mounted Police (RCMP) on behalf of the Government of Canada. The DNA Data Bank Advisory Committee was created pursuant to the *DNA Data Bank Advisory Committee Regulations;* P.C. 2000-635 May 4, 2000 and functions as an independent body to assist the Commissioner of the RCMP in ensuring the NDDB operates in compliance with legislation and regulations. The Advisory Committee's role is also to provide the NDDB with strategic guidance and direction concerning scientific advancements, matters of law, legislative changes, privacy issues, and ethical practices.

The NDDB operates as a national service to all Canadian law enforcement agencies and is part of Forensic Science and Identification Services under the Specialized Police Services (SPS) Branch of the Royal Canadian Mounted Police. The NDDB contributes to the administration of justice and safety of Canadians by assisting in the early identification of those who commit serious crimes across all police jurisdictions in Canada while protecting innocent persons by elimination of suspicion and wrongful conviction.

The NDDB is comprised of two indices which include the Convicted Offenders Index (COI) and the Crime Scene Index (CSI):

1. The **Convicted Offenders Index (COI)** is an electronic index that has been developed from DNA profiles collected from offenders convicted of designated primary and secondary offences identified in Section 487.04 of the *Criminal Code of Canada*, and
2. The **Crime Scene Index (CSI)** is a separate electronic index composed of DNA profiles developed by Canada's operational forensic laboratories from crime scene investigations of the same designated offences addressed in the *Act*.

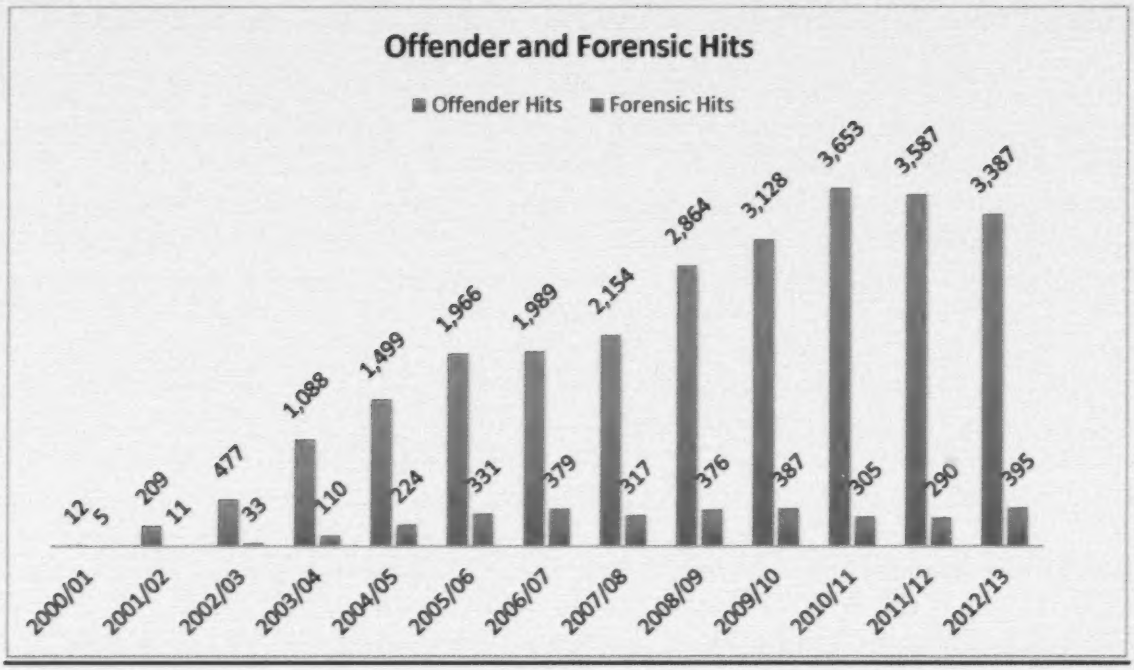
As of March 31st, 2013, the NDDB contained 350,159 DNA profiles which include 266,355 in the Convicted Offender Index and 83,804 in the Crime Scene Index. The following graph demonstrates the significant growth in entries to the NDDB since its inception.



The NDDB assists law enforcement agencies in solving crimes by:

- Linking crimes together where there are no suspects (CSI to CSI match)
- Helping to identify suspects (CSI to COI match and/or CSI to CSI match)
- Eliminating/exonerating suspects (no match between crime scene DNA (CSI) and COI profile in the NDDB)
- Determining whether a serial offender is involved

In the 2012/13 fiscal year, there were 3,387 Offender hits (Convicted Offender to Crime Scene) and 395 Forensic Hits (Crime Scene to Crime Scene) for a total of 3,782 hits that assisted police investigations. The overall growth in both Offender and Forensic hits since the NDDB's creation, as shown hereunder, has contributed significantly to public safety over the years.



Crime scene samples are analyzed and the DNA profiles are uploaded in to the NDDB by the three Canadian forensic laboratory systems:

- The RCMP Forensic Science and Identification Services (RCMP, FS&IS with sites in Halifax, Ottawa, Regina, Edmonton and Vancouver)
- The Centre of Forensic Sciences (CFS) in Toronto and Sault Ste Marie
- The Laboratoire de sciences judiciaires et de médicine légale (LSJML) de Montréal

The dedicated staff of the NDDB, the professionalism and commitment of employees and scientists working in forensic laboratories across Canada, and the partners in the criminal justice system, all working together, have clearly demonstrated the value and benefits of science based investigations in modern society.

National DNA Data Bank Advisory Committee

The National DNA Data Bank Advisory Committee was formalized under the authority of the *DNA Data Bank Advisory Committee Regulations.* The Committee members are recommended by the Commissioner of the RCMP and appointed by the Minister of Public Safety for a five year term that can be renewed. There are currently seven Members of the Committee who have varied backgrounds including law, science, privacy, law enforcement, and ethics. Members of the 2012-2013 Committee are:

Garry LOEPPKY, O.O.M. (Chairperson) D/Commissioner (Rtd), served with the Royal Canadian Mounted Police for 34 years. Throughout his career, D/Commissioner Loeppky was responsible for coordinating and leading major investigations on both a domestic and international level. He worked with numerous foreign law enforcement organizations and has lectured in a number of countries including Canada, Australia, United States and Europe.

Chantal BERNIER, Assistant Commissioner, Office of the Privacy Commissioner of Canada. Ms. Bernier was appointed by Order-in-Council as Assistant Privacy Commissioner (Privacy Act) on December 08, 2008. She holds a Masters in Public International Law from the London School of Economics and Political Science.

Dr. Frederick BIEBER, Associate Professor of Pathology at Harvard University, Boston, Massachusetts. Dr. Bieber is a medical geneticist and specialist in bio-medical ethics. He has an extensive background in genetics research and has been involved with DNA related projects with academic and law enforcement agencies throughout his career.

Gisèle CÔTÉ-HARPER O.C., Q.C. Barrister and Emeritus Professor at the Faculty of Law, University of Laval, Sainte-Foy, Quebec. Madame Coté-Harper is recognized nationally and internationally as a legal expert on Human Rights issues and is a graduate of Harvard Law School.

Dr. William S. DAVIDSON, Medical Genetics Specialist and Professor of Molecular Biology and Biochemistry, Simon Fraser University, Burnaby, B.C. Dr. Davidson has published widely in the area of molecular evolution, population genetics, genomics, and human genetics.

Dr. Ron FOURNEY O.O.M. Director, Science and Strategic Partnerships, Forensic Science and Identification Services, RCMP. Dr. Fourney is a research scientist and a founding member of the RCMP DNA program. He has been instrumental in the development and implementation of forensic DNA typing for Canada.

Dr. Anjali MAZUMDER, Research Fellow in the Department of Statistics at the University of Warwick. Dr. Mazumder has published widely in the fields of forensic DNA identification and value of evidence analysis using probabilistic expert systems and best practices in forensic science. She holds a Doctorate in Statistics from the University of Oxford.

In 2012, the Advisory Committee lost an invaluable individual upon the resignation of The Honourable Peter Cory, C.C., C.D., Q.C., a retired Justice from the Supreme Court of Canada. Justice Cory had served on the Advisory Committee since its inception in 2000 and his presence and wise counsel will be missed. The process is currently underway to identify a replacement for Mr. Justice Cory.

The Advisory Committee recognizes and has discussed the importance of succession planning to ensure there is continuity of membership combined with flexibility to integrate expertise that may be required as the science evolves.

DNA Data Bank Advisory Committee Terms of Reference (TOR)

The TOR, originally drafted pursuant to the creation of the NDDB Advisory Committee in 2000, were reviewed in the past year to ensure they remain relevant as the science of DNA evolves. Furthermore, the expectations of the public with respect to public safety and protection of privacy have placed additional focus on the role of the Advisory Committee. Consequently, minor modifications to the TOR were drafted which strengthen the Mission to permit the Committee, on its own motion, to bring relevant issues on the forensic use of genetic information to the attention of the Commissioner. The Objectives and Scope now also include a provision for the Advisory Committee to recommend changes to legislation or procedures resulting from advancements in forensic DNA research and analysis. The amendments to the Terms of Reference were unanimously supported by the Committee and have now been approved by the Commissioner.

Guests of the National DNA Data Bank Advisory Committee

July 10, 2012 Teleconference

No Guests

October 18/19 Meeting

Greg Yost	Department of Justice (DOJ)
Kelly Morton-Bourgon	Department of Justice (DOJ)
Julie Mugford	Public Safety Canada
Trevor Bhupsingh	Public Safety Canada
Carman Baggaley	Office of the Privacy Commissioner of Canada
Anthony Tessarolo	Centre of Forensic Science (CFS)
Jonathan Newman	Centre of Forensic Science (CFS)
Dr. Jack Ballantyne	University of Central Florida (UCF)
D/Commr. Peter Henschel	Royal Canadian Mounted Police (FS&IS)
A/Commr. François Bidal	Royal Canadian Mounted Police (FS&IS)
Dave Morissette	Royal Canadian Mounted Police (FS&IS)

Isabelle Trudel	Royal Canadian Mounted Police (FS&IS)
Gary Verret	Royal Canadian Mounted Police (FS&IS)
Jeff Modler	Royal Canadian Mounted Police (FS&IS) (Canadian SWGDAM representative)
Insp. Carole Bird	Royal Canadian Mounted Police (FS&IS)

February 07/08 2013

Commissioner Bob Paulson	Royal Canadian Mounted Police
D/Commr. Peter Henschel	Royal Canadian Mounted Police (FS&IS)
A/Commr. François Bidal	Royal Canadian Mounted Police (FS&IS)
Dave Morissette	Royal Canadian Mounted Police (FS&IS)
C/Supt. Charles Walker	Royal Canadian Mounted Police (FS&IS)
Jeff Modler	Royal Canadian Mounted Police (Canadian SWGDAM representative)
Julie Mugford	Public Safety Canada
Greg Yost	Department of Justice (DOJ)
Carman Baggaley	Office of the Privacy Commissioner of Canada
Dr. Michael Szego	University of Toronto
Dr. Tom Callaghan	Federal Bureau of Investigation
S/Sgt. Andrew Raffay	Ontario Provincial Police

This report covers the period from May 2012 to April 2013. During that period of time the National DNA Data Bank Advisory Committee met twice in Ottawa with the first two day meeting in October 2012 and the second two day meeting in February 2013. The Committee also met via teleconference in July 2012. All of the meetings included updates on the operations and performance of the Data Bank including statistical updates, ongoing activities such as training, and initiatives including new technology and business continuity planning for the NDDB. Updates were also provided at all three meetings from a Canadian SWGDAM (Scientific Working Group on DNA Analysis Methods) representative in terms of their activities which affect the NDDB. The two meetings in Ottawa also included updates from Public Safety

Canada and the Department of Justice on initiatives in their respective areas which impact the NDDB.

During the October meeting, the Committee received presentations from:

- Jonathan Newman from the Centre of Forensic Science pursuant to a conference focusing on a multi-disciplinary approach to forensic science in Canada
- Inspector Carole Bird on the National Centre for Missing Persons and Unidentified Human Remains (NCMPUR)
- The Office of the Privacy Commissioner on the protection of genetic information
- Dr. Jack Ballantyne on new developments in forensic DNA analysis

The Advisory Committee's February meeting included presentations from:

- Dr. Michel Szego focusing on the ethical issues associated with advancements in the science of DNA
- Dr. Tom Callaghan from the FBI on their Rapid DNA initiative
- S/Sgt. Andrew Raffay of the OPP on the impact that DNA and the NDDB have on police investigations and public safety

Key issues and highlights of the presentations and their potential impact on the NDDB are further elaborated in this report.

NDDB Year End Summary

Pursuant to the creation of the National DNA Data Bank (NDDB) in 2000, it was anticipated that DNA analysis would become a major investigative tool, but it was beyond imagination that by 2013, over 26,000 offender hits and numerous exonerations would have been the result. However, this result has only been achieved through the dedication and support of staff in the NDDB, the scientists and staff in forensic laboratories in Canada, and the investigators and support staff from various agencies who use this powerful investigative tool. The NDDB's success is largely dependent on its workforce and their continuing commitment to optimize workflow efficiency, minimize operating costs and ensure timely reporting of results to partner forensic laboratories and police agencies. Using current technology a convicted offender's DNA profile is typically uploaded to the COI within eight to twelve days of receipt of the sample collection kit in the NDDB.

An important area for the Advisory Committee related to DNA training for investigators and those in the criminal justice system involved in collection of convicted offender samples and preparation of supporting documentation. Maintaining the integrity and efficiency of the DNA program involves those at the front end of the process. Training was provided in British Columbia, Yukon, CFB Borden, Cornwall, Ontario, Manitoba, and Prince Edward Island. One measure of success of training is in the number of Convicted Offender Kits samples rejected by the NDDB. Approximately 1.4% of convicted offender sample collection kits and endorsements

are rejected by the NDDB. This is relatively low in comparison to other international data banks and is a reflection of the effort put into training initiatives.

Significant enhancements have taken place with respect to new technologies during the past year. New TECAN robotic work stations have been installed and validated with new analytical processes that will enable direct DNA extraction and reduce processing time while increasing efficiency. In addition CODIS (Combined DNA Index system) 7 software has been installed and staff trained within the NDDB and at each of the partner forensic laboratories. The CODIS 7 software introduced significant upgrades which will facilitate faster match comparisons as well as the potential inclusion in the future of new indices that are amenable for missing persons as well as mass disasters victim identification. Additionally, the laboratory information management system (STaCs – Sample Tracking and Control System) is in the process of being upgraded to facilitate the introduction of new sample processing technologies. Two new DNA typing kits will be introduced into the NDDB's sample processing workflow in the coming year which will include additional genetic markers for enhanced discrimination of individuals.

Another important improvement which aligns with good business practices and Government of Canada priorities is the creation and development of a business continuity plan and backup site for the NDDB. This backup site is located in the RCMP Forensic Laboratory in Edmonton and will be implemented in multiple phases. The installation of a backup national CODIS server has been completed and will ensure continuity in reporting match results in the event of a catastrophic event or the unavailability of the NDDB's information technology resources at the Ottawa facility.

In support of international cooperation, the NDDB shares information through an international agreement with Interpol. This agreement, which is approved by the Government of Canada, defines and limits the use of sharing DNA information to the investigation and prosecution of criminal offences. Since its inception, the NDDB has received 1,040 incoming international requests to search its indices resulting in 2 Offender Hits and 2 Forensic Hits. The NDDB has sent out 170 search requests resulting in 2 Offender Hits and 1 Forensic Hit.

The NDDB continues to send out client surveys when a hit (offender to crime scene or crime scene to crime scene) is obtained in the NDDB to determine whether the NDDB contributed towards the identification of a suspect and/or whether the NDDB added value to the criminal investigation. Importantly, 83% of the survey responses indicated that the NDDB contributed to the investigation, but equally important, in 9% of the responses it was reported that DNA served to eliminate an individual as a suspect. In Ontario, the Centre of Forensic Science also does a survey on the effectiveness of DNA in criminal investigations and will be sharing their best practices with the NDDB.

In late 2012, the Standards Council of Canada conducted its biannual Accreditation Audit of the NDDB which identified minor issues of an administrative nature. These issues have been rectified and the NDDB has been accredited until the next audit in 2014.

It should also be noted that the RCMP is currently in the process of consolidating its laboratory services from six sites to three forensic laboratories within the next three years. While this does

not directly impact the NDDB, it does have the potential to impact the efficient operation of the DNA program in Canada and the Advisory Committee will be monitoring this process to ensure there are no negative impacts on the service provided by the NDDB in support of the criminal justice system.

Review of Forensic Service Delivery in Canada

In its Budget 2010, the Federal Government indicated that it intended to explore options for improving the processing of forensic materials and assisting law enforcement in its role by exploring different delivery models for forensic service delivery in Canada. In response, Public Safety Canada commissioned a research project to examine forensic service options. The contract was awarded to Northumbria University Centre of Forensic Science (UK) in the spring of 2011 and was led by Dr. C.N. McGuire, a retired senior forensic scientist and manager from the United Kingdom (UK) Forensic Science Service.

The NDDB Advisory Committee was clearly advised that the study was focused on forensic laboratories and did not include the NDDB. However, it was recognized that DNA plays an important role in many police investigations, and any changes to the forensic service delivery component could ultimately impact the NDDB. Consequently, some members of the NDDB Advisory Committee were interviewed during the research project headed by Dr. McGuire.

The Report, entitled "A Feasible and Sustainable Model for Forensic Service Delivery in Canada", was published on March 30th, 2012 and was provided to the NDDB Advisory Committee by Public Safety Canada in September 2012 with a request that the Advisory Committee provide their views and feedback on the Report and the seven recommendations contained therein.

The Advisory Committee welcomed the opportunity to provide their comments on the study and did so in November 2012. The Committee supported the recommendations outlined in the report which related to enhancing efficiency and effectiveness for the delivery of forensic science in Canada. The Committee did note that caution must be exercised when drawing conclusions with respect to efficiencies and cost factors in RCMP laboratories in the absence of accurate comparative data from other institutions.

The recommendation to consolidate six laboratory sites to three is currently being implemented, however, anticipated savings may be difficult to realize since some of the projected savings were for cancelled capital improvements. These projected expenditure reductions will be a one time saving and not an ongoing cost saving in terms of operations and maintenance once the closures take effect.

The Report also recommended that the option of outsourcing DNA profiling to the public sector be explored. The Advisory Committee accepts that outsourcing forensic DNA is one example of how the private sector could become involved with supporting forensic services in Canada. However, it is important that consideration such as potential costs for technical and data reviews, privacy and security concerns, and the development of common standards acceptable to both public and private forensic participants be developed. From a purely NDDB perspective, it

would be critical that processes were in place to ensure the integrity and reliability of data entered into the Crime Scene Index (CSI) of Canada's National DNA Data Bank and to maintain the confidence of the Canadian public.

The Study also recommended that the program of inter-laboratory Scientific Working Groups be extended to include all investigative processes. The Advisory Committee supports this recommendation, noting that a number of forensic working groups might be required for the various forensic disciplines involved. These groups could play a key role in developing technical, scientific, and service guidelines for Canada. They could also play a role in developing forward looking strategies for the research and development of new technologies.

It was also recommended that research be undertaken in Canada to develop a forensic attrition model to further the understanding of "hidden demand" for forensic support in the investigation of crime, i.e. the proportion of reported offences for which forensic science support is not currently invoked but the investigation of which might benefit from a scientific intervention. The Advisory Committee's view is that there is merit in such a study but recognizes that it would require a comprehensive approach and the support of multiple layers of government, police, forensic service providers, justice representatives, and the courts. The representative on the Advisory Committee from the Office of the Privacy Commissioner emphasized that in any consolidation or greater use of commercial DNA forensic service, a prime concern was the need to respect privacy obligations under federal privacy statutes and the need to safeguard sensitive personal information held by the RCMP in its data banks.

The NDDB Advisory Committee appreciated the opportunity to provide feedback on this study and looks forward to further developments with respect to the recommendations, especially as it relates to the efficient operation of the NDDB.

Biology Casework Analysis Agreements and CSI Submissions

Biology Casework Analysis Agreements (BCAA) were originally set up as a funding mechanism to defray some of the costs of the NDDB when it was established in 2000. DNA samples collected at crime scenes in Ontario and Quebec are analyzed in forensic laboratories operated by those provinces. DNA samples collected by the RCMP from crime scenes in contract jurisdictions are analyzed by the RCMP forensic laboratories in related to offences designated under the *Criminal Code*.
Public Safety officials, in conjunction with the RCMP, have been working collaboratively with RCMP contract jurisdictions and Ontario and Quebec to ensure the sustainability of forensic DNA services in Canada.

The Biology Casework Analysis Agreements (BCAA) were established with the contract jurisdictions as a means of sharing the costs borne by the RCMP for conducting DNA analysis on their behalf. The current agreements are due to expire on March 31, 2014. Officials from Public Safety and Emergency Preparedness have been leading negotiations of a new cost sharing model for future BCAAs that will better reflect the current costs to deliver DNA analysis services. Significant progress has been made with Provinces/Territories on the model and principles for the new BCAAs.

Following the federal budget announcement in 2010, Public Safety and Emergency Preparedness officials established and have been managing the administration of the Biology Casework Analysis Contribution Program through the issuance of payments to the Ontario and Quebec governments to support their forensic laboratories. Under these agreements, Ontario and Quebec receive $3.45 million per year to assist provincial laboratories. In exchange, each province submits DNA profiles taken from crime scenes in their jurisdiction to the Crime Scene Index (CSI) of the NDDB, thereby enhancing the effectiveness of the NDDB as a criminal investigative tool. The agreements with Ontario and Quebec are set to expire on March 31, 2015.

National DNA Utilization Study – Department of Justice

Since the creation of the NDDB, one of the challenges has been to accurately gather statistics on the usefulness of NDDB matches in police investigations. In 2005-2006, the Advisory Committee recommended that a study be undertaken to determine the effectiveness of the NDDB, while the *Senate Standing Committee on Legal and Constitutional Affairs* in 2010 recommended "*That the National DNA Data Bank work cooperatively with law enforcement organizations to collect statistics describing the specific nature of the assistance it provides in police investigations through matches to the convicted offenders index (COI)...*"

The Federal Department of Justice funded a research project in 2011 to study the utilization and effectiveness of forensic DNA in police investigations and criminal prosecutions. The research project, headed by Dr. Darryl Plecas, Director, Centre for Public Safety and Criminal Justice Research at the University of the Fraser Valley in British Columbia, involved an examination of 15 police jurisdictions in the greater Vancouver area to better understand the NDDB's assistance in police investigations and NDDB effectiveness.

The resulting report identified strong support among police officers for the utilization of DNA in criminal investigations. However, the usefulness of the report was hampered by the difficulty of gathering accurate data from the various police jurisdictions. Police files are not maintained with a view to research but rather to meet the needs of the investigation. Consequently, they do not in most cases contain all the information that is needed to assess the effect of DNA on investigations and trials. As a result, many of the data sets, while presenting evidence of the usefulness of DNA, were too small to permit firm conclusions to be drawn. The Advisory Committee supported more research in the future, focused solely on police use of a COI to CSI match.

Missing Persons DNA Index (MPI)

In 2003 the NDDB Advisory Committee dedicated two days to examining the establishment of DNA based Missing Persons Index for Canada pursuant to a request from the Assistant Deputy Solicitor General to provide views and assistance on eleven issues that were considered relevant.

In summary, the Advisory Committee found there were no significant obstacles to the establishment of a Missing Persons Index but that certain privacy, legal, and jurisdictional issues would need to be addressed. In subsequent years, deliberations took place between Public Safety Canada and the Federal, Provincial, and Territorial Working Group in relation to the establishment of a National Missing Persons Index in Canada. Additionally, both the House of Commons and Senate Committees made recommendations concerning this issue in their reports. The House Committee recommended the creation of a Missing Persons Index and Victims Index while the Senate recommended the creation of a Missing Persons Index and Unidentified Human Remains Index to be followed by the creation of a Victims Index.

In 2010, the Federal Budget allocated funding for the establishment of a National Centre for Missing Persons and Unidentified Remains (NCMPUR), but the funding did not include a DNA component within the MPI. A presentation from the Officer in Charge of the NCMPUR allowed the Advisory Committee to gain a clear understanding of the structure, mandate, and operations of the Centre to assist in future deliberations on the feasibility of a DNA component tied to the NCMPUR.

The Advisory Committee continues to support a DNA based Missing Persons and Unidentified Human Remains Index but points out that there are privacy, legal, jurisdictional, and funding mechanisms that must be resolved prior to the implementation of such an index.

Privacy Impact Assessment (PIA)

As a result of evolving science and the increase in numbers in the NDDB, additional DNA markers will be added to enhance the discrimination potential for the NDDB. Although the creation of the NDDB in 2000 predates the Government of Canada's policy to conduct a privacy impact assessment, a PIA has been undertaken. It is anticipated that the PIA will be completed in 2014 and will address both current and future requirements.

Canadian Scientific Working Group on DNA Analysis Methods (SWGDAM)

Canadian SWGDAM was created pursuant to a memorandum of understanding signed on January 31st, 2011 between the Centre of Forensic Sciences, the Laboratoire de sciences judiciaires et de médicine légale and the RCMP to make it a recognized government working group for DNA analysis in Canada. It is composed of representatives from all three public forensic laboratories and the NDDB who research, review, and provide recommendations on issues related to evolving DNA science, policy, and technology. The Chairperson, elected by his/her peers, attends Advisory Committee meetings to provide updates on SWGDAM's activities in support of the NDDB.

In the past year, Canadian SWGDAM has developed a draft NDDB DNA Acceptance Standards document which addresses technical and policy requirements for DNA profile upload to the Crime Scene Index (CSI). Current work includes a review of new functionality within CODIS 7 for storing and searching partial DNA profiles, modifying the acceptance criteria for mixtures into the CSI, evaluating the possible creation of a single Canadian population database for use in forensic casework, as well as developing formal review criteria for the introduction of new

technologies. The Advisory Committee will review the SWGDAM Committee's report and evaluate its recommendations prior to advising the Commissioner of potential proposed changes.

Familial Searching

Familial searching may be defined as the deliberate targeting and evaluation of DNA profiles within a data base that does not include the DNA profile from the subject of interest, but may include a relative who can be identified by looking at close but not perfect "matches". This typically involves the interrogation of a large DNA profile data base composed of known individuals with an unknown DNA profile developed from crime scene. Canada and the NDDB currently do not engage in familial searching and would require a legislative change to perform this analysis as well as scientific and technical changes to how matches are made within the NDDB. While recognizing that there are legislative and privacy issues that must be addressed, it is important to note that more jurisdictions are embracing the use of familial searching to enhance public safety while also serving to exonerate the innocent. As indicated in previous reports, it has been shown that novel searching methods could allow for the expanded use of the NDDB to aid in the possible identification of criminal suspects who may be closely related to known offenders in the COI.

The Advisory Committee will continue to focus on the application of familial searching in other jurisdictions, assess the impacts, and examine options which might be acceptable from a Canadian perspective that provides police with an important investigational tool while safeguarding privacy.

Forensic Science in Canada – A Report of Multidisciplinary Discussion

Jonathan Newman, Deputy Director, Centre of Forensic Science, Ontario presented an overview of a two day conference hosted by the University of Forensic Science and Medicine at the University of Toronto in May 2012. The conference included forensic scientists and experts in nine disciplines and its objective was to examine the state of forensic science in Canada. It was recognized that public and judicial confidence in forensic science had been eroded by several high profile cases where wrongful convictions have raised the question of the reliability of forensic science in both the scientific and legal community. While improvements have been made, the conference members concluded that forensic sciences must continue to develop in Canada to enhance public safety, health, and the criminal justice system. This will require the coordinated efforts of academic institutions, governments, those in the criminal justice system, and forensic scientists.

One of the nine forensic science disciplines examined was that of Forensic Biology. This discipline is comprised of a relatively small community of scientists dispersed in Ontario, Quebec, and RCMP laboratories. While there are no mandatory professional standards for forensic biology laboratories, there are well defined and consistent guidelines and, standards and proficiency testing requirements creating strict checks and balances under which forensic laboratories operate.

It was noted that Canada has legislation and safeguards to protect the use of personal information and biological samples and associated DNA profiles, including the NDDB Advisory Committee, whose role it is to ensure the integrity of Canada's DNA Data Base and to assist in preventing potential abuses.

However, to maintain a professional workforce, it was recommended that there should be a funding mechanism for academic institutions specifically focused on education for forensic science. It was also pointed out that there is a requirement to enhance research and create a supportive system to develop forensic scientists for the future.

Protecting Genetic Information – Office of the Privacy Commissioner (OPC)

The Advisory Committee was provided an overview of the role and mandate of the OPC with respect to the protection of genetic information in Canada. The OPC is responsible for the *Privacy Act* which applies to federal departments and agencies (including the NDDB), and the *Personal Information Protection and Electronic Documents Act* (PIPEDA) which applies to the private sector and governs such issues as the use of genetic information by Direct to Consumer companies, insurance companies, pharmaceutical companies and federally regulated employers. Of note is that "personal information" in both *Acts* includes genetic information although the term is not found in either Act. Current priorities of the OPC related to genetics are the *DNA Identification Act*/NDDB, Direct to Consumer Testing, and use of genetic information by insurance companies.

Dealing specifically with the *DNA Identification Act*/NDDB, the OPC has participated on the NDDB Advisory Committee since its inception and has commissioned comparative international research on the Canadian approach with respect to forensic DNA. They have concluded that the Canadian regime compares well to other jurisdictions and is generally more protective of privacy. However, they do note concerns with respect to possible expansion of the *Act* and suggest that changes must be assessed in terms of necessity, effectiveness, proportionality and a review of less invasive alternatives.

Forensic DNA Technology Update – Dr. Jack Ballantyne - University of Florida

Dr. Ballantyne provided the Advisory Committee with an overview of the research he has been involved in, how the science is evolving, and implications for consumers and users of DNA information. His presentation included new methods on the collection of DNA from crime scenes and approaches to contextually link the sample to the suspect. Dr. Ballantyne's research has taken him beyond DNA to RNA which is the intermediary molecule between the coding information (DNA) and the final building blocks (proteins) in our bodies. RNA analysis may allow a more precise differentiation of the tissue origin of biological samples. He also spoke about his research with respect to the degradation of DNA samples which could allow determination of a window of time that the sample was deposited. Dr. Ballantyne discussed his research on the Y chromosome which allows for greater discrimination between male donors from the same lineage. He also highlighted that the Y chromosome has in the past raised questions and concerns about indicators of behaviour when applied in a medical context.

Dr. Ballantyne noted that in many forensic laboratories in the U.S 18 loci are currently used for discrimination while Canada is only using 14. He pointed out that as the data base grows, it would be important to increase the number of loci used to enhance discrimination not only within our own data bank, but also for international comparisons. In addition, many of the new STR kits which are being released offer significant advantages for both forensic data bases and operational casework. The new systems have more discrimination (additional DNA markers) and provide much better results on challenging biological samples. The new kits incorporate the European STR systems and adoption by the NDDB would ensure both European and North American STR standardization. Dr. Ballantyne also discussed the development of a rapid DNA analysis process and new equipment which is currently being field tested in six booking stations in Florida, and which will allow the development of a DNA profile in 90 minutes.

Dr. Ballantyne's presentation offered the Committee an insight in to developing issues and challenges that will need to be addressed by Canada to ensure we remain aligned and consistent with the application and utilization of DNA internationally in the future.

Rapid DNA – Dr. Tom Callaghan, Federal Bureau of Investigation

Dr. Callaghan, Senior Biometric Scientist for the FBI laboratory, presented to the Advisory Committee (via teleconference) the FBI's current study with respect to Rapid DNA (R-DNA) which is a fully automated process of developing an STR profile from a reference sample buccal swab. The goal is to deploy Rapid DNA profiling systems to minimize processing time and maximize utility of information. The "swab in – profile out" process consists of automated extraction, amplification, separation, detection and allele calling with human intervention.

The integration of R-DNA into CODIS will require the development of a Rapid DNA Index System (RDIS) to provide real-time feedback on the sample submitted for search against the Data Bank. The two hour turnaround time will involve developing a CODIS DNA profile from an arrestee in under one hour and then searching the National DNA Index System during the second hour.

The FBI is currently in the test phase with respect to R-DNA instrumentation and acknowledges that issues such as quality assurance standards, changes to legislation, and integration with CODIS software and criminal history systems must be addressed. The timeframe for full deployment to police offices is projected to be three years with significant issues and challenges to be addressed in the interim. The Advisory Committee recognizes the benefits of R-DNA as it relates to crime scene investigation, but is also cognizant of the challenges that must be addressed before deployment in a Canadian context. However, as technology and science advance to provide faster access to DNA analysis results, Canada must also be prepared to adjust to approaches which contribute to public safety while also respecting privacy.

Ethical Issues Associated with Advances in Genomics – Dr. Michael Szego

Dr. Szego, a Clinical Ethicist from the Centre of Clinical Ethics in Toronto provided the Advisory Committee with challenges and ethical issues associated with advances in genomics. In a comparison between a forensic DNA data base and a bio bank for medical research, he noted

that the NDDB is governed by the DNA Identification Act and the circumstances under which DNA can be used are strictly regulated. In the medical field, there is more emphasis on informed consent and patient/research subject confidentiality. Dr. Szego discussed the Personal Genome Project and pointed out that there is no assurance of confidentiality since data could be included in an open access public data base. It also raises the question of when and what should be disclosed to a participant in a study if a critical health issue is inadvertently discovered during the research phase. Current Canadian Guidelines require researchers to disclose findings which have been interpreted as having significant welfare implications for the participant, whether health related, psychological, or social.

While there are no direct implications for the NDDB, Dr. Szego pointed out that there is a precedent in the UK National DNA Data Base where samples can be searched under strict and limited conditions. With advances in genomics, there is evidence to suggest that common traits and behaviours have a stronger genetic component than previously thought, and it is in this area that it may be of relevance to public safety and the administration of justice.
Dr. Szego commented that privacy in the genomic area will be a challenge in the future as whole genome sequencing will soon be widely available to clinicians. As the predictive power of genetics increase, it can be anticipated that societal interest in the broad benefits that can be derived from genetics such as health, safety, and security will grow.

DNA – A Front Line Perspective - S/Sgt. Andrew RAFFAY – Ontario Provincial Police

S/Sgt. Raffay was invited to attend the Advisory Committee meeting to provide a front line perspective on how the utilization of DNA and the NDDB was assisting front line investigators, the impact it had on public safety and the criminal justice system, and a field perspective on strengths and weaknesses on the application of DNA legislation in Canada. S/Sgt. Raffay outlined two cases where DNA had played a critical role. In the first case involving an armed robbery, four suspects were identified through line ups, tips, and police sources. However, an exhibit believed related to the crime scene contained DNA which did not match any of the four suspects but later led to the identification of the actual offender who was subsequently convicted of the crime. Most importantly, it led to the exoneration of four suspects who had been identified through traditional police investigative approaches and remained suspects until the actual offender was arrested.

The second case involved a stolen car ring in Southwestern Ontario where DNA matches from stolen vehicles identified a group of individuals who were responsible for a large number of vehicle thefts. The arrest and conviction of this group, based largely on DNA evidence, has resulted in a 40% reduction in the number of stolen vehicles in that region.

S/Sgt. Raffay pointed out that each OPP Detachment has a DNA coordinator and ultimately are accountable to a provincial DNA coordinator which ensures a 100% response rate by the OPP for all DNA orders.

S/Sgt Raffay also noted that inclusion of offences such as break and enters for which DNA can be taken has resulted in increased confidence by the public since these types of crimes are traditionally difficult to solve and leave significant psychological scars on the victims.

With respect to the efficiency and effectiveness of application of DNA legislation, S/Sgt. Raffay commented that there is a need for enhanced education throughout the criminal justice system to ensure orders are made, drafted, and administered consistently and in accordance with the Act. Too often, orders are not sought or not granted for primary offences, or administrative gaps in the processing of the orders result in no action or an inability to compel the convicted offender to attend and provide a sample.

He also suggested that recommendations from the Standing Senate Committee on Legal and Constitutional Affairs of June 2010 as they relate to qualifying offences and streamlined collection processes would, if implemented, strengthen and enhance the public safety component of DNA and its use in Canada.

While the DNA Identification Act has greatly contributed to public safety and the conviction of criminals and the exoneration of innocent subjects, there are steps that can be taken which will further enhance what the science has to offer.

Conclusions for 2012-2013

The Advisory Committee has monitored the operation of the NDDB and the provisions of the DNA Identification Act since 2000. Over that period of time, there have been significant advances in the science, and as demonstrated by those who presented to the Advisory Committee this year, the pace of change will only increase in terms of the science itself, technology, public interest, privacy, and public safety.

The NDDB is a reflection of our best use of science to serve justice and it remains the view of the Advisory Committee that the NDDB is fulfilling its role effectively and operating appropriately within the provisions of the DNA Identification Act and associated Regulations. It should be noted that the absence of A Base funding is a continual challenge to the NDDB's ability to maintain full staff, research and evaluate new technologies which ensure currency with international partners, and provides a high level of training to enhance efficiency. It also creates uncertainty within the program for the dedicated individuals who work tirelessly to provide a world class DNA forensic service for Canada and its citizens.